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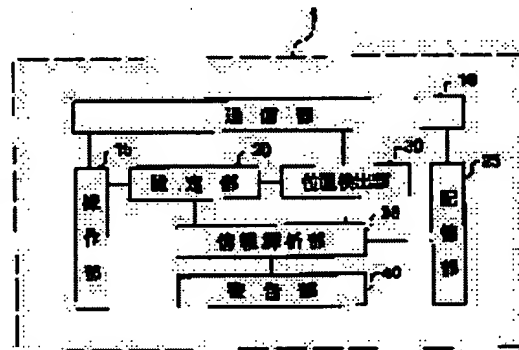
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(54) WARNING APPARATUS FOR MOBILE COMMUNICATION TERMINAL

(57)Abstract:

PROBLEM TO BE SOLVED: To enhance the security of a mobile communication terminal and to protect an operator from an accident.

SOLUTION: When a setting section 20 sets a position detection section 30 of a mobile phone 1 to a danger warning mode, the detection section 30 receives GPS information by a wireless signal from a GPS satellite (not shown) to continuously acquire geometrical position information of a current location of the mobile phone 1 and transmits the geographical position information to a map server 100 at an interval of 5 minutes. The map server 100 uses a searching section 60 to search map information in a range of 10 km square around the geometrical position indicative of the geometrical position information received from the mobile phone 1 from a map information storage section 55 storing the map information representative of the geometrical range of dangerous areas in the whole of Japan and returns the result to the mobile phone 1 via a communication section 10. A storage section 25 of the mobile phone 1 stores the map information received via a communication section 10. An information analysis section 35 confirms whether or not the geographical position of the current position is resident in a dangerous area on the basis of the geographical position information of the current position obtained by the position detection



section 30 and the map information stored by the storage section 25 and allows a warning section 40 to raise a warning tone when in the dangerous area.

LEGAL STATUS

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TECHNICAL FIELD

[Field of the Invention] This invention relates to the warning device for pocket communication terminals, and the warning device for more specifically telling the user of a pocket communication terminal about risk.

[Translation done.]

PRIOR ART

[Description of the Prior Art] In recent years, a cellular phone and pocket communication terminals, such as a pocket tool for electronic mail transmission and reception, are spreading rapidly. These pocket communication terminals are used with various gestalten, such as playing a game, accessing the Internet or carrying out network shopping as well as an original message, transmission and reception of an electronic mail, etc. Moreover, according to these various use gestalten, the function of a pocket communication terminal is also substantial, and the pocket communication terminal with the camera for picturizing has already been common sense, it has a GPS function, and the pocket communication terminal which can know the geography location of a its present location is calling subject by the TV commercial etc.

[Translation done.]

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] The block diagram showing the cellular-phone insurance structure of a system used as the 1st operation gestalt of the warning device for pocket communication terminals of this invention

[Drawing 2] The block diagram showing the configuration of the cellular-phone machine 1 in the cellular-phone safety system shown in drawing 1

[Drawing 3] The block diagram showing the configuration of the map server 100 in the cellular-phone safety system shown in drawing 1

[Drawing 4] The flow chart which shows the actuation of a cellular-phone safety system shown in drawing 1

[Drawing 5] The block diagram showing the configuration of the cellular-phone machine 2 used as the 2nd operation gestalt of the warning device for pocket communication terminals of this invention

[Drawing 6] The flow chart which shows actuation of the cellular-phone machine 2 shown in drawing 5

[Description of Notations]

1 Cellular-Phone Machine

2 Cellular-Phone Machine

10 Communications Department

15 Control Unit

20 Setting Section

25 Storage Section

30 Location Detecting Element

35 Information Analysis Section

40 Warning Section

50 Communications Department

55 Map Information Storage Section

60 Retrieval Section

100 Map Server

110 Communications Department

115 Control Unit

120 Setting Section

125 Camera Control Section

130 Camera

135 Information Analysis Section

140 Warning Section

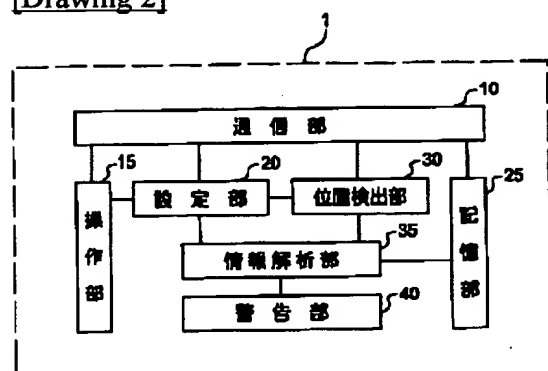
[Translation done.]

DRAWINGS

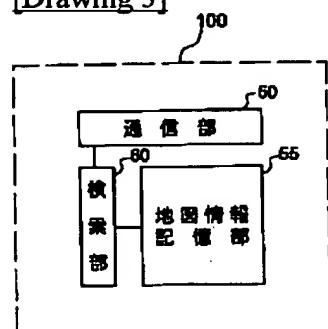
[Drawing 1]



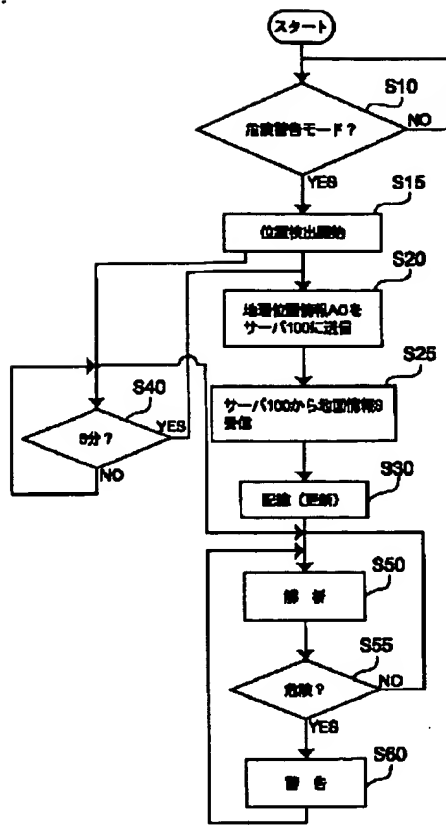
[Drawing 2]



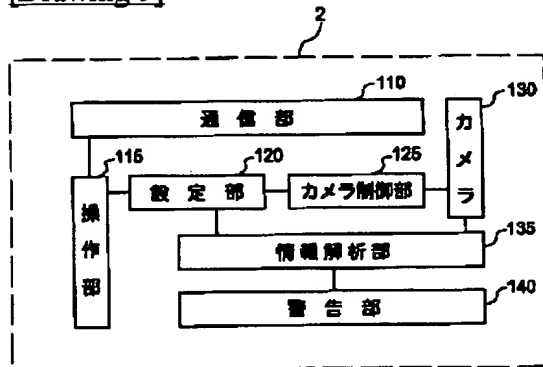
[Drawing 3]



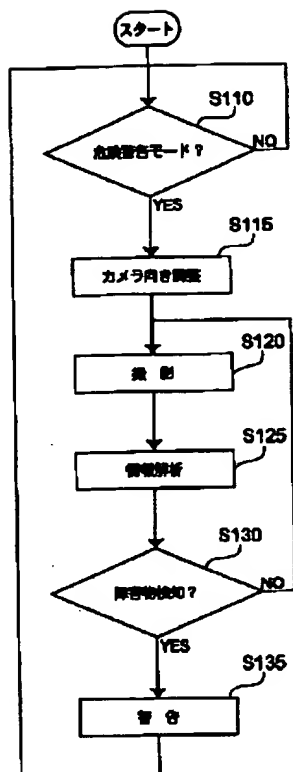
[Drawing 4]



[Drawing 5]



[Drawing 6]



[Translation done.]

EFFECT OF THE INVENTION

[Effect of the Invention] According to the warning device for pocket communication terminals of this invention, [whether the geography location of a pocket communication terminal is in geography within the limits of a hazard area, and] It is based on whether it is the no as which the obstruction was detected within the limits of predetermined [ahead of the migration direction of a communication terminal], and the danger of the present location of a pocket communication terminal is judged. Or when danger is high, Even if it carries out using a pocket communication terminal etc. while the user of a pocket communication terminal walks since the user of a pocket communication terminal can be told about risk with a warning means, he can notice risk and it is safe.

[0016]

[Embodiment of the Invention] Hereafter, with reference to a drawing, the cellular-phone safety system used as the 1st operation gestalt of the warning device for pocket communication terminals of this invention is explained.

[0017] Drawing 1 is the block diagram showing the cellular-phone insurance structure of a system of this operation gestalt. Like illustration, the cellular-phone machine 1 which consists of a cellular-phone machine 1 used as a communication terminal and a map server 100 which offers the map information which shows the geography range of the hazard area of the Japan whole country, and the map server 100 can connect the cellular-phone safety system of this operation gestalt through a public correspondence network.

[0018] Drawing 2 is the block diagram showing the configuration of the cellular-phone machine 1 in the cellular-phone safety system shown in drawing 1 . With the communications department 10 for performing the thing of transmitting and receiving the cellular-phone machine 1 with other communication terminals, or accessing the Internet like illustration The control unit 15 for operating telephoning, reading an electronic mail or playing a game etc. using the cellular-phone machine 1, When set as "risk warning Mohd" by the setting section 20 and the setting section 20 for setting the mode of operation of the cellular-phone machine 1 as "risk warning Mohd" or the "normal mode", While receiving the GPS information by the radio signal from the GPS Satellite which is not illustrated, acquiring the geography positional information A0 of the present location of the cellular-phone machine 1 and transmitting to the map server 100 through the communications department 10 with the antenna which is not illustrated Then, the location detecting element 35 outputted to the information analysis section 35 which continues acquiring the geography positional information (referred to as A1 in distinction from the above-mentioned geography positional information A0) of the present location of the cellular-phone machine 1, and mentions it later until the power source of the cellular-phone machine 1 is turned off or it is reset as the "normal mode" by the setting section 20, The storage section 25 which memorizes the map information S which shows the geography range of a hazard area of the range around 10 square kilometers of geography locations shown by the geography positional information A0 which the map server 100 has transmitted, and which was transmitted from the location detecting element 30, The geography positional information A1 of the present location which has continued being outputted from the location detecting element 25, When the geography location which analyzes the map information S memorized by the storage section 25, and is shown by the geography positional information A1 is located in the range of the hazard area shown using the map information S, It is the configuration which consists of the information analysis section 35 outputted to the warning section 40 which judges that danger is high and mentions this decision result later, and the warning section 40 which sounds a beep sound according to a decision result that danger is high from the information analysis section 35. In addition, once the location detecting element 30 transmits the geography positional information A0 of a its present location to an eye at the map server 100, the geography positional information A0 of a new present location is transmitted to the map server 100 every 5 minutes, and the storage section 25 updates the map information on the 10-square kilometer range that it returned whenever the map server 100 received the geography positional information A0 of a its present location from the location detecting element 30, every 5 minutes.

[0019] Drawing 3 is the block diagram showing the configuration of the map server 100 in this operation gestalt. The map server 100 in this operation gestalt like illustration The cellular-phone machine 1, the communications department 50 which transmit and receive, and the map information storage section 55 which memorized the map information which shows the geography range of the hazard area of the Japan whole country, It is based on the geography positional information A0 of the present location of the cellular-phone machine 1 which received through the communications department 50. From the map information storage section 55, the map information S on the 10 square kilometer range of circumferences centering on the geography location shown by the geography positional information A0 of this present location is detected, and it consists of the retrieval section 60 which transmits to the cellular-phone machine 1 through the communications department 50.

[0020] Subsequently, with reference to drawing 4, actuation of the cellular-phone safety system of this operation gestalt is explained more concretely. In addition, in order to make the main point of this invention intelligible, in case actuation of the cellular-phone machine 1 is explained, explanation of the control unit 15 which operates telephoning, reading an electronic mail or playing a game etc. is omitted.

[0021] Drawing 4 is a flow chart which shows the actuation of a cellular-phone safety system shown in drawing 1. Like illustration, if "risk warning Mohd" is set up by the setting section 20 (S10:Yes), first, through the antenna which is not illustrated, the cellular-phone machine 1 will receive the GPS information by the radio signal from a GPS Satellite, will acquire the geography positional information A0 of the present location of the cellular-phone machine 1, and will transmit the location detecting element 30 to the map server 100 through the communications department 10 (S15, S20). If the geography positional information A0 from the location detecting element 30 is received through the communications department 50, the retrieval section 60 of the map server 100 will detect the map information S which shows the geography range of a hazard area of within the limits around 10 square kilometers of geography locations shown by the geography positional information A0 from the map information storage section 55, and will return it to the cellular-phone machine 1. The storage section 25 of the cellular-phone machine 1 memorizes the map information S from the server 100 which received by the communications department 10 (S25, S30). Moreover, while the location detecting element 30 continues acquiring the geography positional information A1 of the present location of the cellular-phone machine 1 and after location detection initiation of step S15 outputs it to the information analysis section 35, the geography positional information A1 A0 of the present location at that time, i.e., the geography positional information of the present location at that time, is transmitted to the map server 100 every 5 minutes. The retrieval section 60 of the map server 100 retrieves the map information S on the range around 10 square kilometers of geography locations shown by this geography positional information A0 whenever it receives the geography positional information A0 from the cellular-phone machine 1 through the communications department 50 from the map information storage section 55, and returns it to the cellular-phone machine 1. Whenever the storage section 25 receives the new map information S from a server 100 through the communications department 10, it updates the contents of storage (S40:Yes, S20, S25, S30).

[0022] On the other hand, the information analysis section 35 of the cellular-phone machine 1 continues (S50) analyzing the map information S memorized by the geography positional information A1 and the storage section 25 of the present location which it continued acquiring by the location detecting element 30. When the geography location shown by the geography positional information A1 is located in the geography range of the hazard area shown using the map information S (for example, crossing zone), although it judges that danger is high and a beep sound can be sounded in the warning section 40 (it Yes (es) S55: —) the geography of the hazard area where the geography location shown by S60 and the geography positional information A1 is shown using the map information S — when out of range, it judges that danger is low, and a beep sound is not sounded, but analysis is continued (S55:No).

[0023] In addition, it is repeated until actuation from step S15 to step S60 is reset as the "normal mode" by the setting section 20 of the cellular-phone machine 1 or the power source of the cellular-phone machine 1 is turned off.

[0024] According to the cellular-phone safety system of this operation gestalt, by setting it as "risk

warning Mohd" thus, the information analysis section 35 The geography positional information A1 of the present location of the cellular-phone machine which it is continuing detecting by the location detecting element 30, Since a beep sound can be sounded by the warning section 40 when it continues supervising whether the present location of a cellular phone plunges based on the map information S memorized by the storage section 25, and it is located in hazard areas, such as a zone, and a its present location is located in a hazard area Even if it operates a cellular-phone machine with a walk, an operator can notice risk and can prevent accident.

[0025] Moreover, it is more safe, if warning is taken out before making the geography range of a hazard area into the predetermined range which includes not the inside of a crossing zone but a crossing zone in the case of a crossing, and an operator's crossing it and going it into a zone.

[0026] Moreover, although he is try to acquire the map information S on the its present location circumference from the map server 100 in order that the cellular phone safety system of this operation gestalt may mitigate the burden of a cellular phone machine, you may make it memorize the map information on the predetermined range beforehand, and may make it the capacity of the storage section memorize the map information on a certain time, for example, the Japan whole country, enough.

[0027] Drawing 5 is the block diagram showing the configuration of the cellular-phone machine 2 used as the 2nd operation gestalt of the warning device of this invention. Like illustration, the cellular-phone machine 2 of this operation gestalt With the communications department 110 for performing the thing of transmitting and receiving with other communication terminals, or accessing the Internet The control unit 115 for operating telephoning, reading an electronic mail or playing a game etc. using the cellular-phone machine 2, When set as "risk warning Mohd" by the setting section 120 and the setting section 120 for setting the mode of operation of the cellular-phone machine 2 as "risk warning Mohd" or the "normal mode", the front (the direction of a transverse plane of the operator at the time of operating a cellular-phone machine —) of the operator who operates the cellular-phone machine 2 for the sense of the camera 130 mentioned later Namely, while adjusting so that it may be horizontally [ahead of the migration direction of the operator and cellular-phone machine when moving, while an operator operates it] suitable The camera control section 125 which it continues making a camera 130 photo, and sense adjustment are possible. While it is suitable in the direction adjusted by an operator's hand control and the camera sense controller 125 The camera 130 which takes a photograph when photography control is carried out by the camera control section 125, when a shutter is pushed, It is the configuration which consists of the information analysis section 135 which analyzes to the image of the front which photoed with the camera 130 and was obtained, and judges danger, and the warning section 140 which warns by sounding a beep sound when it is judged by the information analysis section 135 that danger is high.

[0028] Although the various proposal of the approach of detecting a front obstruction using the image ahead of the migration direction photoed and acquired with the camera, the video camera, etc., and judging danger is made, the information analysis section 135 in the cellular-phone machine 2 of this operation gestalt detects an obstruction using the approach proposed by JP,6-107096,A as one example. that is , the information analysis section 135 of the cellular phone machine 2 of this operation gestalt obtain a velocity vector by discover the point corresponding to these photographic subjects from an image a and an image b , and connect it with a line first paying attention to the time amount t which continued photo the front with a camera 130 and acquire , and the photographic subjects (a telegraph pole , a building , etc.) in two images (consider as an image a and an image b respectively) in time amount $t + \Delta t$. This velocity vector is an optical flow. These optical flows. It appears in a radial from one point called FOE in an image (Focus of Expansion). It corresponds to one point which shows a travelling direction in FOE when it is called an infinity point or a vanishing point and the cellular-phone machine 2 and the operator are going straight on. Thus, the direction of a radial is presented from the optical flow called for when the cellular-phone machine 2 and the operator are moving, and FOE. Here, the optical flow emitted from the front photographic subject includes the information which consists of a location of the photographic subject to the cellular-phone machine 2 and an operator, relative velocity, etc., and it is considered that danger is high, so that an optical flow is long.

[0029] The information analysis section 135 of the cellular-phone machine 2 outputs a decision result

that danger is high to the warning section 140 while detecting this photographic subject as an obstruction, when it asks for the optical flow emitted from a front photographic subject using the image of the front which continued photoing with a camera 130 and was obtained and an optical flow exceeds the die length of a predetermined threshold. From the information analysis section 135, the warning section 140 will warn by sounding a beep sound, if a decision result that danger is high is received.

[0030] Drawing 6 is a flow chart which shows actuation of the cellular-phone machine 2 of this operation gestalt. The camera control section 125 makes a seriography perform to a camera 130 first in the cellular-phone machine 2 of this operation gestalt, like illustration, if set as "risk warning Mohd" by the setting section 120 (S110:Yes) while adjusting it to horizontally [front] the sense of a camera 130 was mentioned above (S115, S120). The information analysis section 135 uses this photographic subject as an obstruction, when it asks for the optical flow of the photographic subject in the image which photoed continuously with the camera 130 and was obtained and the die length of the optical flow of a certain photographic subject exceeds the die length of a predetermined threshold, and it tells the warning section about danger being high (S125, S130:Yes). From the information analysis section 135, the warning section 140 will warn by sounding a beep sound, if a decision result that danger is high is received (S135). On the other hand, in step S130, when the obstruction is not detected (S130:No), the processing from step S120 is repeated.

[0031] Moreover, it is continued by the processing 130 from step S120, i.e., a camera, until the cellular-phone machine 2 is turned off or processing of photography, the obstruction detection by the information analysis section 135, danger decision, etc. is reset as the "normal mode" by the setting section 120.

[0032] thus, according to the cellular-phone machine 2 of this operation gestalt, from the image which continued photoing the front of the cellular-phone machine 2 and an operator's migration direction, and obtained it When it asks for the optical flow of each photographic subject and the optical flow of a certain photographic subject exceeds the die length of a predetermined threshold, while detecting this photographic subject as an obstruction and judging it that danger is high By the ability sounding a beep sound, the operator who operates a cellular-phone machine with a walk can prevent the accident of colliding with an obstruction, and can keep an operator's insurance.

[0033] As mentioned above, although the desirable operation gestalt of the warning device for pocket communication terminals of this invention was explained, the warning device of this invention can add various increase and decrease and modification, unless it is not restricted to the operation gestalt mentioned above and the main point of this invention is changed.

[0034] For example, although a cellular-phone machine is equipped with the function in connection with risk warning, such as judging danger in an operation gestalt to two warning devices mentioned above, and warning, and he is trying to plan reduction of a production cost, and an operator's convenience, it is made the thing of the standalone version equipped with the interface for connecting the warning device of this invention with a cellular-phone machine, it connects with a cellular-phone machine, and you may make it use.

[0035] Moreover, the pocket communication terminal which the warning device of this invention applies may not be restricted to a cellular-phone machine, either, and what kind of pocket communication terminal is sufficient as the pocket tool for electronic mail transmission and reception, the pocket tool for Internet access, etc.

[0036] Moreover, you may be what kind of thing which warning performed by the warning section can also tell that risk is not only to what is depended on voice but to an operator.

[Translation done.]

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the warning device for pocket communication terminals, and the warning device for more specifically telling the user of a pocket communication terminal about risk.

[0002]

[Description of the Prior Art] In recent years, a cellular phone and pocket communication terminals, such as a pocket tool for electronic mail transmission and reception, are spreading rapidly. These pocket communication terminals are used with various gestalten, such as playing a game, accessing the Internet or carrying out network shopping as well as an original message, transmission and reception of an electronic mail, etc. Moreover, according to these various use gestalten, the function of a pocket communication terminal is also substantial, and the pocket communication terminal with the camera for picturizing has already been common sense, it has a GPS function, and the pocket communication terminal which can know the geography location of a its present location is calling subject by the TV commercial etc.

[0003]

[Problem(s) to be Solved by the Invention] However, while the above substantial functions of a pocket communication terminal have brought the user immense facilities, it may bring the user of a pocket communication terminal risk by the method of use. For example, the user who is amusing himself with the game or becomes absorbed in a web page and screens, such as an electronic mail, using the cellular-phone machine equipped with the game function with the walk may go into hazard areas, such as a free [from not knowing] crossing, or obstructions, such as a telegraph pole, may be collided with, and when the worst, accident on which a user's life is dropped may also happen.

[0004] This invention is made in view of the above-mentioned situation, and though the facilities of a pocket communication terminal are used, it aims at offering the warning device for pocket communication terminals which can protect a user from risk.

[0005]

[Means for Solving the Problem] The warning device for pocket communication terminals of this invention (it omits below and is called a warning device) is characterized by being the thing which comes to have a danger decision means to judge the danger of the present location of a pocket communication terminal, and a warning means to warn when it is judged by said danger decision means that the danger of said present location is high.

[0006] Here, of course, the pocket communication terminal to which the warning device of this invention is applied contains [the pocket tool for transmission and reception of an electronic mail etc.] any pocket communication terminals for a cellular-phone machine.

[0007] The warning device of this invention may be the thing of the standalone version which is for pocket communication terminals, may be built in a pocket communication terminal, may be united with a pocket communication terminal, and is used for a pocket communication terminal, connecting.

[0008] With moreover, "warning" performed by said warning means The user of said pocket communication terminal (since the warning device of this invention is used for what was united with the pocket communication terminal, and a pocket communication terminal, connecting, the user of a pocket communication terminal) You may be what kind of thing which can tell risk for becoming the user of a warning device at coincidence, and a beep sound, the warning message displayed on the screen of a pocket communication terminal, flashing of a light, etc. can be mentioned as an example.

[0009] Said danger decision means in the warning device of this invention is equipped with a hazard area information acquisition means acquire the hazard area information which shows the geography range of a hazard area, and a location monitor means continue acquiring the information which shows the geography location of said present location, and when the geography location of said present location acquired by said location monitor means is in geography within the limits of said hazard area, it

shall judge that the danger of said present location is high.

[0010] Here, it considers as the map information "hazard area information" indicates the geography range of hazard areas, such as a crossing, and a cliff, a pond, to be, and the geography range of a hazard area was indicated to be, and things can be carried out. Moreover, as for a hazard area information acquisition means, it is desirable to acquire said hazard area information on said its present location neighborhood from the view which may acquire the hazard area information for example, on the Japan whole country, and mitigates the burden of a pocket communication terminal.

[0011] Moreover, when [what kind of] the warning device of this invention is equipped with storage and the owner of the time of sale of said warning device or a warning device wants, The hazard area information on the range for which an owner asks is made to record on this storage. Said hazard area information acquisition means Although you may make it acquire hazard area information from this storage, it does not carry out making hazard area information memorize beforehand to the warning device of this invention. Said hazard area information acquisition means It is desirable to acquire said hazard area information from the server equipment connectable [with a network] by the way which is the need. In addition, it can consider as the time of having meant the time of an operator needing risk warning of being based on a warning device etc. at "the required time", for example, being set as "risk warning Mohd", when it is the warning device which can set up "risk warning Mohd" and the "normal mode", the time when the warning device was able to be turned on, etc. here.

[0012] Moreover, said location monitor means is the present location (it united with the pocket communication terminal, or is also the present location of the warning device of this invention connected with the pocket communication terminal) (GPS location detection equipment etc. can be mentioned as an example that what is necessary is just what can acquire a geography location.) of said pocket communication terminal. Moreover, a pocket communication terminal may use the GPS location detection function of a pocket communication terminal, when it has location detection functions, such as GPS.

[0013] When said danger decision means of this invention is equipped with a perimeter situation monitor means of the migration direction of said personal digital assistant of said present location to continue supervising the front at least and an obstruction is detected within the limits of predetermined [of said front] by said perimeter situation monitor means, it shall be judged that the danger of said present location is high.

[0014] With the "monitor" by said perimeter situation monitor means here It can be supposed that said predetermined range is photoed with a camera etc. at this time a danger decision means For example, picturized with image pick-up equipments, such as a camera, and obtained as indicated by JP,6-107096,A. Migration of the same point on the object object copied out into the image of two coma which gets mixed up in time is detected as an optical flow, and an obstruction can be detected based on the magnitude and appearance location.

[0015]

[Effect of the Invention] According to the warning device for pocket communication terminals of this invention, [whether the geography location of a pocket communication terminal is in geography within the limits of a hazard area, and] It is based on whether it is the no as which the obstruction was detected within the limits of predetermined [ahead of the migration direction of a communication terminal], and the danger of the present location of a pocket communication terminal is judged. Or when danger is high, Even if it carries out using a pocket communication terminal etc. while the user of a pocket communication terminal walks since the user of a pocket communication terminal can be told about risk with a warning means, he can notice risk and it is safe.

[0016]

[Embodiment of the Invention] Hereafter, with reference to a drawing, the cellular-phone safety system used as the 1st operation gestalt of the warning device for pocket communication terminals of this invention is explained.

[0017] Drawing 1 is the block diagram showing the cellular-phone insurance structure of a system of this operation gestalt. Like illustration, the cellular-phone machine 1 which consists of a cellular-phone

machine 1 used as a communication terminal and a map server 100 which offers the map information which shows the geography range of the hazard area of the Japan whole country, and the map server 100 can connect the cellular-phone safety system of this operation gestalt through a public correspondence network.

[0018] Drawing 2 is the block diagram showing the configuration of the cellular-phone machine 1 in the cellular-phone safety system shown in drawing 1. With the communications department 10 for performing the thing of transmitting and receiving the cellular-phone machine 1 with other communication terminals, or accessing the Internet like illustration The control unit 15 for operating telephoning, reading an electronic mail or playing a game etc. using the cellular-phone machine 1, When set as "risk warning Mohd" by the setting section 20 and the setting section 20 for setting the mode of operation of the cellular-phone machine 1 as "risk warning Mohd" or the "normal mode", While receiving the GPS information by the radio signal from the GPS Satellite which is not illustrated, acquiring the geography positional information A0 of the present location of the cellular-phone machine 1 and transmitting to the map server 100 through the communications department 10 with the antenna which is not illustrated Then, the location detecting element 35 outputted to the information analysis section 35 which continues acquiring the geography positional information (referred to as A1 in distinction from the above-mentioned geography positional information A0) of the present location of the cellular-phone machine 1, and mentions it later until the power source of the cellular-phone machine 1 is turned off or it is reset as the "normal mode" by the setting section 20, The storage section 25 which memorizes the map information S which shows the geography range of a hazard area of the range around 10 square kilometers of geography locations shown by the geography positional information A0 which the map server 100 has transmitted, and which was transmitted from the location detecting element 30, The geography positional information A1 of the present location which has continued being outputted from the location detecting element 25, When the geography location which analyzes the map information S memorized by the storage section 25, and is shown by the geography positional information A1 is located in the range of the hazard area shown using the map information S, It is the configuration which consists of the information analysis section 35 outputted to the warning section 40 which judges that danger is high and mentions this decision result later, and the warning section 40 which sounds a beep sound according to a decision result that danger is high from the information analysis section 35. In addition, once the location detecting element 30 transmits the geography positional information A0 of a its present location to an eye at the map server 100, the geography positional information A0 of a new present location is transmitted to the map server 100 every 5 minutes, and the storage section 25 updates the map information on the 10-square kilometer range that it returned whenever the map server 100 received the geography positional information A0 of a its present location from the location detecting element 30, every 5 minutes.

[0019] Drawing 3 is the block diagram showing the configuration of the map server 100 in this operation gestalt. The map server 100 in this operation gestalt like illustration The cellular-phone machine 1, the communications department 50 which transmit and receive, and the map information storage section 55 which memorized the map information which shows the geography range of the hazard area of the Japan whole country, It is based on the geography positional information A0 of the present location of the cellular-phone machine 1 which received through the communications department 50. From the map information storage section 55, the map information S on the 10 square kilometer range of circumferences centering on the geography location shown by the geography positional information A0 of this present location is detected, and it consists of the retrieval section 60 which transmits to the cellular-phone machine 1 through the communications department 50.

[0020] Subsequently, with reference to drawing 4, actuation of the cellular-phone safety system of this operation gestalt is explained more concretely. In addition, in order to make the main point of this invention intelligible, in case actuation of the cellular-phone machine 1 is explained, explanation of the control unit 15 which operates telephoning, reading an electronic mail or playing a game etc. is omitted.

[0021] Drawing 4 is a flow chart which shows the actuation of a cellular-phone safety system shown in drawing 1. Like illustration, if "risk warning Mohd" is set up by the setting section 20 (S10:Yes), first,

through the antenna which is not illustrated, the cellular-phone machine 1 will receive the GPS information by the radio signal from a GPS Satellite, will acquire the geography positional information A0 of the present location of the cellular-phone machine 1, and will transmit the location detecting element 30 to the map server 100 through the communications department 10 (S15, S20). If the geography positional information A0 from the location detecting element 30 is received through the communications department 50, the retrieval section 60 of the map server 100 will detect the map information S which shows the geography range of a hazard area of within the limits around 10 square kilometers of geography locations shown by the geography positional information A0 from the map information storage section 55, and will return it to the cellular-phone machine 1. The storage section 25 of the cellular-phone machine 1 memorizes the map information S from the server 100 which received by the communications department 10 (S25, S30). Moreover, while the location detecting element 30 continues acquiring the geography positional information A1 of the present location of the cellular-phone machine 1 and after location detection initiation of step S15 outputs it to the information analysis section 35, the geography positional information A1 A0 of the present location at that time, i.e., the geography positional information of the present location at that time, is transmitted to the map server 100 every 5 minutes. The retrieval section 60 of the map server 100 retrieves the map information S on the range around 10 square kilometers of geography locations shown by this geography positional information A0 whenever it receives the geography positional information A0 from the cellular-phone machine 1 through the communications department 50 from the map information storage section 55, and returns it to the cellular-phone machine 1. Whenever the storage section 25 receives the new map information S from a server 100 through the communications department 10, it updates the contents of storage (S40:Yes, S20, S25, S30).

[0022] On the other hand, the information analysis section 35 of the cellular-phone machine 1 continues (S50) analyzing the map information S memorized by the geography positional information A1 and the storage section 25 of the present location which it continued acquiring by the location detecting element 30. When the geography location shown by the geography positional information A1 is located in the geography range of the hazard area shown using the map information S (for example, crossing zone), although it judges that danger is high and a beep sound can be sounded in the warning section 40 (it Yes (es) S55: —) the geography of the hazard area where the geography location shown by S60 and the geography positional information A1 is shown using the map information S — when out of range, it judges that danger is low, and a beep sound is not sounded, but analysis is continued (S55:No).

[0023] In addition, it is repeated until actuation from step S15 to step S60 is reset as the "normal mode" by the setting section 20 of the cellular-phone machine 1 or the power source of the cellular-phone machine 1 is turned off.

[0024] According to the cellular-phone safety system of this operation gestalt, by setting it as "risk warning Mohd" thus, the information analysis section 35 The geography positional information A1 of the present location of the cellular-phone machine which it is continuing detecting by the location detecting element 30, Since a beep sound can be sounded by the warning section 40 when it continues supervising whether the present location of a cellular phone plunges based on the map information S memorized by the storage section 25, and it is located in hazard areas, such as a zone, and a its present location is located in a hazard area Even if it operates a cellular-phone machine with a walk, an operator can notice risk and can prevent accident.

[0025] Moreover, it is more safe, if warning is taken out before making the geography range of a hazard area into the predetermined range which includes not the inside of a crossing zone but a crossing zone in the case of a crossing, and an operator's crossing it and going it into a zone.

[0026] Moreover, although he is try to acquire the map information S on the its present location circumference from the map server 100 in order that the cellular phone safety system of this operation gestalt may mitigate the burden of a cellular phone machine, you may make it memorize the map information on the predetermined range beforehand, and may make it the capacity of the storage section memorize the map information on a certain time, for example, the Japan whole country, enough.

[0027] Drawing 5 is the block diagram showing the configuration of the cellular-phone machine 2 used

as the 2nd operation gestalt of the warning device of this invention. Like illustration, the cellular-phone machine 2 of this operation gestalt With the communications department 110 for performing the thing of transmitting and receiving with other communication terminals, or accessing the Internet The control unit 115 for operating telephoning, reading an electronic mail or playing a game etc. using the cellular-phone machine 2, When set as "risk warning Mohd" by the setting section 120 and the setting section 120 for setting the mode of operation of the cellular-phone machine 2 as "risk warning Mohd" or the "normal mode", the front (the direction of a transverse plane of the operator at the time of operating a cellular-phone machine —) of the operator who operates the cellular-phone machine 2 for the sense of the camera 130 mentioned later Namely, while adjusting so that it may be horizontally [ahead of the migration direction of the operator and cellular-phone machine when moving, while an operator operates it] suitable The camera control section 125 which it continues making a camera 130 photo, and sense adjustment are possible. While it is suitable in the direction adjusted by an operator's hand control and the camera sense controller 125 The camera 130 which takes a photograph when photography control is carried out by the camera control section 125, when a shutter is pushed, It is the configuration which consists of the information analysis section 135 which analyzes to the image of the front which photoed with the camera 130 and was obtained, and judges danger, and the warning section 140 which warns by sounding a beep sound when it is judged by the information analysis section 135 that danger is high.

[0028] Although the various proposal of the approach of detecting a front obstruction using the image ahead of the migration direction photoed and acquired with the camera, the video camera, etc., and judging danger is made, the information analysis section 135 in the cellular-phone machine 2 of this operation gestalt detects an obstruction using the approach proposed by JP,6-107096,A as one example. that is , the information analysis section 135 of the cellular phone machine 2 of this operation gestalt obtain a velocity vector by discover the point corresponding to these photographic subjects from an image a and an image b , and connect it with a line first paying attention to the time amount t which continued photo the front with a camera 130 and acquire , and the photographic subjects (a telegraph pole , a building , etc.) in two images (consider as an image a and an image b respectively) in time amount $t + \Delta t$. This velocity vector is an optical flow. These optical flows. It appears in a radial from one point called FOE in an image (Focus of Expansion). It corresponds to one point which shows a travelling direction in FOE when it is called an infinity point or a vanishing point and the cellular-phone machine 2 and the operator are going straight on. Thus, the direction of a radial is presented from the optical flow called for when the cellular-phone machine 2 and the operator are moving, and FOE. Here, the optical flow emitted from the front photographic subject includes the information which consists of a location of the photographic subject to the cellular-phone machine 2 and an operator, relative velocity, etc., and it is considered that danger is high, so that an optical flow is long.

[0029] The information analysis section 135 of the cellular-phone machine 2 outputs a decision result that danger is high to the warning section 140 while detecting this photographic subject as an obstruction, when it asks for the optical flow emitted from a front photographic subject using the image of the front which continued photoing with a camera 130 and was obtained and an optical flow exceeds the die length of a predetermined threshold. From the information analysis section 135, the warning section 140 will warn by sounding a beep sound, if a decision result that danger is high is received.

[0030] Drawing 6 is a flow chart which shows actuation of the cellular-phone machine 2 of this operation gestalt. The camera control section 125 makes a seriography perform to a camera 130 first in the cellular-phone machine 2 of this operation gestalt, like illustration, if set as "risk warning Mohd" by the setting section 120 (S110:Yes) while adjusting it to horizontally [front] the sense of a camera 130 was mentioned above (S115, S120). The information analysis section 135 uses this photographic subject as an obstruction, when it asks for the optical flow of the photographic subject in the image which photoed continuously with the camera 130 and was obtained and the die length of the optical flow of a certain photographic subject exceeds the die length of a predetermined threshold, and it tells the warning section about danger being high (S125, S130:Yes). From the information analysis section 135, the warning section 140 will warn by sounding a beep sound, if a decision result that danger is high is received (S135). On the other hand, in step S130, when the obstruction is not detected (S130:No), the

processing from step S120 is repeated.

[0031] Moreover, it is continued by the processing 130 from step S120, i.e., a camera, until the cellular-phone machine 2 is turned off or processing of photography, the obstruction detection by the information analysis section 135, danger decision, etc. is reset as the "normal mode" by the setting section 120.

[0032] thus, according to the cellular-phone machine 2 of this operation gestalt, from the image which continued photoing the front of the cellular-phone machine 2 and an operator's migration direction, and obtained it When it asks for the optical flow of each photographic subject and the optical flow of a certain photographic subject exceeds the die length of a predetermined threshold, while detecting this photographic subject as an obstruction and judging it that danger is high By the ability sounding a beep sound, the operator who operates a cellular-phone machine with a walk can prevent the accident of colliding with an obstruction, and can keep an operator's insurance.

[0033] As mentioned above, although the desirable operation gestalt of the warning device for pocket communication terminals of this invention was explained, the warning device of this invention can add various increase and decrease and modification, unless it is not restricted to the operation gestalt mentioned above and the main point of this invention is changed.

[0034] For example, although a cellular-phone machine is equipped with the function in connection with risk warning, such as judging danger in an operation gestalt to two warning devices mentioned above, and warning, and he is trying to plan reduction of a production cost, and an operator's convenience, it is made the thing of the standalone version equipped with the interface for connecting the warning device of this invention with a cellular-phone machine, it connects with a cellular-phone machine, and you may make it use.

[0035] Moreover, the pocket communication terminal which the warning device of this invention applies may not be restricted to a cellular-phone machine, either, and what kind of pocket communication terminal is sufficient as the pocket tool for electronic mail transmission and reception, the pocket tool for Internet access, etc.

[0036] Moreover, you may be what kind of thing which warning performed by the warning section can also tell that risk is not only to what is depended on voice but to an operator.

[Translation done.]

CLAIMS

[Claim(s)]

[Claim 1] The warning device for pocket communication terminals characterized by being the thing which comes to have a danger decision means to judge the danger of the present location of a pocket communication terminal, and a warning means to warn when it is judged by said danger decision means that the danger of said present location is high.

[Claim 2] The warning device for pocket communication terminals characterized by to be what judges that the danger of said present location is high when the geography location of said present location which was equipped with a hazard area information acquisition means to by_which said danger decision means acquires the hazard area information which shows the geography range of a hazard area, and a location monitor means continue acquiring the information which shows the geography location of said present location, and was acquired by said location monitor means is in geography within the limits of said hazard area.

[Claim 3] The warning device for pocket communication terminals according to claim 2 characterized by said hazard area information acquisition means being what acquires said hazard area information on said its present location neighborhood.

[Claim 4] The pocket communication terminal according to claim 2 or 3 characterized by being that to which said hazard area information acquisition means acquires said hazard area information from server equipment connectable [with a network].

[Claim 5] The warning device for pocket communication terminals according to claim 1 characterized by being what judged that the danger of said present location is high when said danger decision means is equipped with a perimeter situation monitor means of the migration direction of said personal digital assistant of said present location to continue supervising the front at least and an obstruction is detected within the limits of predetermined [of said front] by said perimeter situation monitor means.

[Translation done.]